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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



Appellant : Howard Barr
Appl. No. : 09/611,177
Filed : July 6, 2000
For : GUIDANCE SYSTEM
FOR RADIO-
CONTROLLED
AIRCRAFT
Examiner : Dinh, T.

Group Art Unit 3644

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(Date)

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REPLY BRIEF

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Sir:

Pursuant to 37 C.F.R. § 1.193(b), Appellant hereby replies to the arguments raised in the Examiner's Answer mailed June 18, 2004.

On page 3, lines 6-10, the Examiner's Answer contends that since the specification identifies commercial suppliers of various accelerometers, such accelerometers constitute Admitted Prior Art *with respect to the claims*.

Appellant respectfully disagrees. Although various accelerometers may have been commercially available at the time of filing, this fact does not make their use in the claimed systems and methods obvious to one of ordinary skill in the relevant art. In particular, the claims are not directed to accelerometer devices in isolation. Rather, the claims are directed to a method of modifying a flight pattern, a control system in a remote-controlled aircraft, a system for preventing crashes of a remote controlled aircraft, and a system in a remotely controlled aircraft for preventing crashes.

The accelerometers are components of the claimed methods and systems and are integrated into the claimed methods and systems. For example, method claim 18 includes reading

positioning signals corresponding to a current attitude of a remote controlled aircraft from a two-axis accelerometer. As another example, system claim 24 includes an accelerometer that provides positioning signals representing the attitude of a remote control aircraft.

The mere commercial availability of accelerometers does not constitute prior art as to the claimed use of the accelerometers. For example, the availability of accelerometer devices does not inherently lead one of ordinary skill in the art to use such devices to read positioning signals corresponding to a current attitude of a remote controlled aircraft (claim 18), nor does their mere availability inherently teach one to provide positioning signals representing the attitude of a remote control aircraft (claim 24). Although the commercially-available accelerometers were capable of being integrated into the claimed methods and systems, the mere fact that elements and/or limitations in the claims were commercially available at the time of filing does not *prima facie* render methods and systems that include these elements and/or limitations obvious.

Indeed, the Office Action mailed July 1, 2003 acknowledges that an obviousness rejection requires more than a mere showing that elements and/or limitations recited in the claims were, in isolation, commercially available. In particular, page 3, line 20-22 of the action asserts that it would have been obvious to have used the accelerometers disclosed by the admitted prior art in Jenkins' system to "know the operating status of the flight vehicle and to prevent damage to it." In effect, the Office action also seeks to rely upon the mere commercial availability of accelerometers as "admitted prior art" to establish a suggestion or motivation to combine the accelerometers with other claim elements and/or limitations.

This reliance on the commercial availability of the accelerometers is broader than the scope of any "admission" identified in the Examiner's Answer. In particular, the Examiner's Answer only contends that the specification admits that accelerometers are well-known. The Examiner's Answer does not provide evidence whatsoever of any suggestion in the "omitted" prior art to combine the commercially-available accelerometers to provide the claimed systems and methods.

Appellant therefore respectfully submits that the Examiner's Answer acknowledges a deficiency with the commercially available accelerometers, namely, that the commercially available accelerometers do not include a suggestion or motivation to combine them with the other claim elements and/or limitations. Any attempt to draw a suggestion to combine from the

commercially available accelerometers thus amounts to baseless speculation and neglects the requirement that any obviousness rejection be founded in the scope and content of the prior art.

Please note that the absence of a suggestion to combine with the commercially available accelerometers was raised in Section X.B of the Appeal Brief filed March 29, 2004. To the best of Appellant's reading, the Examiner's Answer did not address this issue at all and hence has failed to carry the burden of establishing a *prima facie* case of obviousness.

On page 3, lines 11-20 and again on page 4, line 9-20, the Examiner's Answer contends that the pitch rate limiter of FIG. 3 of Jenkins modifies a pilot's input control signals based on the operational status of an aircraft so that the aircraft will not fly in a flight or pattern outside of a set of defined performance parameters. However, a review of FIG. 3 shows that this is plainly not the case.

Jenkins' pitch rate limiter is simply a negative feedback regulator of the pitch of the aircraft. In particular, the pitch rate is the rate of change of the pitch angle. Absent a pitch rate limiter, during flight of an aircraft, pitch angle generally can change due to turbulence, wind, or other factors outside of human control. For example, the pitch angle of an aircraft that has been directed to fly level with the horizon can change even when there is no change in the control signal directing the aircraft to fly level.

A pitch rate limiter can therefore be used to limit the rate of change in pitch angle without modifying the underlying control signal, such as appears to be the case in Jenkins. Referring to col. 2, line 48-49, Jenkins' pitch rate limiter is part of the autopilot. Rather than inappropriately ascribing undisclosed functionality to the autopilot, as done by the Examiner at page 4, line 17-19 (i.e., "an autopilot is a computer that takes inputs from the pilot and sensors that monitors [sic] the operational status of the aircraft to safely control the aircraft"), Appellant respectfully submits that Jenkins' autopilot "controls pitch, yaw, and roll rate as well as the throttle setting *in accordance with the transmitted control signals* (Jenkins, col. 2, line 34-37) (emphasis added.)" Jenkins' pitch rate limiter thus does not modify a pilot's input control signals but instead controls the aircraft using a negative feedback mechanism to maintain the pitch at a desired setting.

On page 4, lines 1-5, the Examiner's Answer contends that Berejik describes a control module that modifies control signals and that therefore Berejik remedies the deficiencies of Jenkins. As discussed below, this is incorrect.

The claims relate to methods and systems where the modification of control signals is based, at least in part, on positioning signals representing the attitude of a remote-controlled aircraft. Referring to FIG. 4 of Berejik, it can be seen that limiter circuit LR limits the bank-angle command signal to safe values to prevent turnover and instability, and limiter circuit LP limits the pitch-angle command signal to safe values to prevent stall and rapid descent. These limitations are clearly made in the absence of any information regarding the attitude of the remote-controlled aircraft. As shown in FIG. 4 of Berejik, the rate of turn sensor ROTs and rate of climb sensor ROCS do not input any information at all into the limiter circuits LR, LP. Rather, limiter circuits LR, LP operate based solely on command inputs.

As such, Appellant respectfully submits that Berejik also fails to describe or suggest the modification of control signals based, at least in part, on positioning signals representing the attitude of a remote-controlled aircraft and that a *prima facie* case of obviousness has not been established.


CONCLUSION

Appellant submits that the claim limitations discussed above only represent illustrative distinctions from the cited art. There may be other patentable features that distinguish the claimed invention from the cited art.

In view of this Reply Brief and the Appeal Brief filed March 29, 2004, Appellant respectfully submits that all of the pending claims are in condition for allowance.

Respectfully submitted

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